

# Department Of Civil Engineering

## GEOTECHNICAL ENGINEERING LABORATORY

Geotechnical engineering is a branch of civil engineering concerned with the engineering behaviour of earth materials. It uses principles of soil mechanics and rock mechanics to investigate subsurface conditions and materials, determine the relevant physical and chemical properties of these materials.

**Objectives:-** The student will gain hands-on experience in conducting soil laboratory tests to determine soil parameters needed for geotechnical engineering design, and to communicate this information with others



## List of Experiment:-

- + Determination of natural moisture content using oven drying method.
- + Specific gravity of soil grains by density bottle method or pycnometer method.
- + Field density using core cutter method
- + Field density using s replacement method.
- + Field identification of fine grained soils
- + Grain size distribution by sieve analysis
- + Grain size distribution by hydrometer analysis
- + Consistency limits: Liquid limit, plastic limit
- + Consistency limit: Shrinkage limit
- + Permeability test using constant head method
- + Permeability test using falling head method
- + Compaction test: stard proctor / IS light compaction
- + Compaction test: modified proctor / IS heavy compaction
- + Relative density
- + Differential free swell index test/ un-restrained swell test
- + Determination of Pre-consolidation pressure coefficient of consolidation from one dimensional consolidation Test
- + Determination of shear parameters form unconsolidated undrained tri-axial compression test.
- + Determination of shear parameters from direct shear Test.
- + Determination of cohesion from unconfined compression test.
- + Determination of CBR value from CBR Test.
- + Determination of shear strength of soft clays from vane shear test
- + Determination of swelling pressure of clays.

## List of Instruments:-

- # Consolidation Test Apparatus
- # Tri-Axial Compression Test Apparatus
- # Direct Shear Test Apparatus
- # CBR Test Apparatus.
- # Unconfined Compression Test Apparatus
- # Laboratory VANE Shear Apparatus Hand Operated
- # Consistency Limit Apparatus
- # Universal or combination permeability Apparatus: Accessories
- # Soil Hydrometer:
- # Core Cutter (Cylindrical)

## Instruments Picture:-

**Tri-Axial Compression Test Apparatus**



**CBR Test Apparatus**



**Unconfined Compression Test Apparatus**



**Direct Shear Test Apparatus**



**Electronic Oven**



**Consolidation Test Apparatus**

